VERIFICATION OF TRANSLATION

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declare that I am a certified translator well acquainted with both the German and English languages, and that the attached is an accurate translation, to the best of my knowledge and ability, of the International Patent Application **PCT/DE 00/02635.**

Signature _____ Date 14 MAY 2001

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Electrical Machine

Background of the Invention

~~Prior Art~~

~~The invention relates to an electrical machine, in~~ particular a generator, ~~according to the preamble to the independent claim.~~

WO 99/017430 has disclosed a generator with an annular gap seal. A spacer between a pulley and a roller bearing is disposed so that it produces an annular gap with a part fastened to the hub. This annular gap, however, has only a limited sealing action. This annular gap seal is only in a position to prevent the penetration of larger particles into the space between the spacer and the roller bearing. This limited sealing action results in the disadvantage that this annular gap seal does not have any sealing action with regard to fluids and smaller particles.

Summary

~~Advantages~~ of the Invention

~~In the electrical machine according to the invention,~~ with the characterizing features of the independent claim, it is possible to embody the annular gap seal so that it also has a sealing action with regard to fluids and smaller particles. The improved annular gap seal protects the roller bearing, which is already sealed by sealing disks and is therefore also protected from the damaging influence of fluids. This is particularly advantageous if the vehicle, which contains the electrical machine according to the ~~invention, must have a so-called fording ability and~~

Ins. a2 concl'd.

~~therefore must also be suitable for driving through flooded areas.~~

~~Advantageous modifications and improvements of the~~ features disclosed ~~in the~~ independent claim are achieved by ~~the steps taken in the dependent claims.~~

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Brief Description of the Drawings

~~Drawings~~

The invention will be explained in detail below in an exemplary embodiment in conjunction with the accompanying drawings.

Fig. 1 is a longitudinal section through the electrical machine according to the invention, wherein the upper half of the drawing shows a sectional view of a rotor of the machine and the bottom half of the drawing shows a side view of the rotor;

Fig. 2 is a section through an annular gap seal according to the invention.

Identical components or components which have the same function are labeled with the same reference numerals.

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Description of the Preferred ~~Exemplary~~ Embodiments

In the upper half of the drawing, Fig. 1 shows a longitudinal section through the electrical machine according to the invention. The electrical machine, in the structural form of a generator in this instance, has a cup-

shaped housing 10, which is closed by a housing cover 14. A stator 18 that encompasses a rotor 22 is fastened inside the cup-shaped housing 10. The rotor 22 is supported at one end by a bearing 26 in the housing bottom 30 and at the other end by a roller bearing 34 in the housing cover 14. The roller bearing 34 is supported with a shaft-side bearing ring 38 on a rotor shaft 42. On the side oriented toward the hub, the roller bearing 34 is supported in the housing cover 14 by means of a hub-side bearing ring 46. The housing cover 14 forms a hub 54 by means of a shoulder 50. The axial position of the shaft-side bearing ring 38 is defined by a shaft collar 57 to which the shaft-side bearing ring 38 is secured by a nut 60 by means of a collar 63 of a pulley 66 and a first component 69 disposed between the collar 63 and the bearing ring 38. The first component 69 is non-rotatably connected to the shaft 42. On the hub side, a covering cap 72 covers an electrical switch 75, which is disposed radially outside the shoulder 50. A second component 78 is fastened to the covering cap 72 and rests against the bearing ring 46 oriented toward the machine. The covering cap 72 and the second component 78 are both non-rotatably connected to the housing cover 14 and therefore to the hub 54. An annular gap 81 is formed between the shaft 42, or the first component 69 non-rotatably connected to the shaft 52, and the second component 78 non-rotatably connected to the hub 54.

Ins. a3

~~Fig. 2 shows the annular gap 81 and its vicinity in~~ detail. As is clear, the annular gap 81 ~~is at~~ least partially filled with a ~~pasty~~ material 84. In particular, this pasty material 84 is grease. The annular gap 81 is at least ~~partially~~ U-shaped. The U-shaped region 87 of the ~~annular gap 81 has free leg ends 90, 91, which are directed~~

radially inward toward the shaft 42. The two free leg ends 90, 91 of the U-shaped region 87 are separated from each other by an annular disk-shaped collar 93. The annular disk-shaped collar 93 is formed onto and is of one piece with the first component 69 and thereby protrudes radially outward. The annular disk-shaped collar 93 thereby extends into a recess 96 of the hub 54 or the second component 78 connected to the covering cap. The hub 54 is supported on the roller bearing 34 so that it can rotate in relation to the shaft 42. The roller bearing 34 has a radially oriented sealing disk 99 which partially adjoins the U-shaped region 87 of the annular gap 81. It is favorable if the annular disk-shaped collar 93 is embodied on the first component 69 and that the first component 69 thereby serves as a spacer ring 102 for the shaft-side bearing ring 38 of the roller bearing 34. It is also favorable if the recess 96 is disposed in the covering cap 72 constituted by the second component 78.

If the electrical machine shown in Fig. 1 is driven by means of the pulley 66, then the annular disk-shaped collar 93 rotates in the recess 96 of the second component 78. If the pasty material 84, for example grease, is introduced into the annular gap 81 as described above, then the pasty material 84 is spun radially outward by the friction on the annular disk-shaped collar 93 and the rotating speed of the collar 93. This results in the fact that the pasty material 84 collects in the U-shaped region 87, particularly in the outer regions. Depending on how much material 84 is introduced into the annular gap 81, the U-shaped region 87 is more or less filled. With a maximal filling, both free legs of the U-shaped region 87 are filled. As a result, the connection between the roller bearing 34 and the outside is tightly closed. In order for the sealing action in the

filled annular gap 81 to be retained in the presence of water pressure, the pasty material 84 should be selected in such a way that on the one hand, it adheres well to both the second component 78 and the first component 69 and on the other hand, has good internal cohesion. A favorable balancing of these material properties has the advantage that at least at low pressures, water pressing against the annular gap seal cannot penetrate to the bearing side, behind the annular disk-shaped collar 93.